

CLAIMS:

1. A burner for use in the manufacture of synthetic quartz glass, comprising a main burner comprising  
5 a multi-tube assembly of a three or more tube construction including a center tube for feeding a silica-forming compound, a first outer tube surrounding the center tube for feeding a combustion-supporting gas, and a second outer tube surrounding the first outer tube for  
10 feeding a combustible gas,  
a first tubular shell surrounding the multi-tube assembly for feeding a combustible gas,  
a plurality of first nozzles disposed within the first tubular shell for feeding a combustion-supporting gas,  
15 a second tubular shell surrounding the first tubular shell for feeding a combustible gas, and  
a plurality of second nozzles disposed within the second tubular shell for feeding a combustion-supporting gas.
- 20 2. The burner of claim 1 wherein the total cross-sectional area of gas discharge ports of the first nozzles disposed in the first tubular shell accounts for at least 5% of the cross-sectional area of an annular space between the multi-tube assembly and the first tubular shell.  
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3. The burner of claim 1 wherein the total cross-sectional area of gas discharge ports of the second nozzles disposed in the second tubular shell accounts for at least 5% of the cross-sectional area of an annular space  
30 between the first and second tubular shells.
4. The burner of claim 1, further comprising a tubular jacket disposed outside the main burner to surround at least an end portion thereof.